

An Essay
on
Inflammation.
✱

Respectfully Submitted
to the
Homoeopathic Medical College
of
Pennsylvania
On the 10th day of February 1850
for the
Doctorate of Medicine
by
John Redman Coxe Jun^r.
of
Philadelphia -
✱

"In the first steps of our inquiry, we meet indeed with much variety, and obscurity; but the further we penetrate into Nature, we find so much analogy amongst her works, as to be forced to acknowledge, and to revere, her simplicity."

Pringle. On Army Diseases.

On Inflammation.

Before I proceed to consider the subject of Inflammation, it may not be improper, to consider certain Phenomena occurring in the system; which I shall hereafter endeavour to shew, are intimately connected with it, as they tend to elucidate many of its symptoms, and in a more satisfactory manner, I apprehend, than has hitherto been accomplished.

The Phenomena alluded to, are Animal Heat, and the Red colour of the blood; And here I mean not to enter into a copious detail, of all the theories which have been produced, to account for the causes of these interesting, and curious operations of Nature; as it would far exceed the limits I have prescribed for myself, in this Essay. I shall content myself with stating the method I suppose to be employed by Nature to effect her purpose, with my reasons for the opinion. After which I shall proceed to treat of Inflammations, and shew the place they hold in this curious process of the disordered animal economy, made use of by Nature, to regain her empire in the system.

I shall first say a few words with re-

gard to the blood itself; by which I mean - That fluid which circulates in the human body, by means of the arteries and veins; is of a red colour; and appears to be one homogeneous mass, whilst warm, and in motion; and which supports life, by furnishing to every part of the body, its peculiar nutritive portion -

In tracing the blood through its circulation, we are struck with the great difference in its qualities, in the arteries, and veins - This difference consists. 1st In its being of a more fluid consistence in the arteries, than in the veins. 2^d Its intensity of colour being greater in the arteries, than in the veins. 3^d In arterial blood putrefying much sooner than venous. We are also struck with the difference of its temperature in different species of animals; some having it warmer, and others colder, than the medium in which they live -

In view of these differences in the same peculiar fluid, we are naturally led to inquire into the process, by which Nature accomplishes such curious phenomena - I will therefore, in elucidation, proceed to state some particulars

of each part of the blood. Although blood appears to be, while circulating in the body, a perfectly homogeneous fluid, yet, by permitting it to stand for some time, when drawn from the body, by venesection, or otherwise, we find it separate into two portions. Serum, or Lymph, and Crassamentum, or Crux. This last is further separable into coagulable lymph, or gluten, and red globules.

Of the Serum

This is of a transparent yellowish colour, remaining fluid in atmospheric temperature, but coagulating at the 160^{th} degree of Fahrenheit. It seems to be this part of the blood, which is peculiarly appropriated, for the various secretions in the human body. This, I infer, from finding it in a much smaller proportion in the blood of healthy individuals, whose secretions are normal, than in those of lax, and debilitated habits, in whom this function is imperfectly performed; and in Asiatic Cholera, the serous, or watery portion of the blood, being exhausted by the intestinal discharges, as "Rice Water" stools, the urinary discharge is almost entirely suspended, and the bladder is found devoid of urine.

Of the Crassamentum.

This is divided, as above observed, into Gluten, and Red Globules. The former may be obtained, either by washing away the red globules, or by collecting it on a stick, by stirring up the blood while warm. It may be rendered perfectly white, by repeated washings, and appears to be of a fibrous structure, whence it has been denominated the fibrous portion of the blood. This part of the blood appears to be more particularly serviceable in the formation, and growth of the body. This I infer, from observing its use in wounds and fractures, which never heal, til' by the affusion of this substance, as granulations, or callus, a bed is formed, for the elongation of the vessels; or, until the force of the circulation in the ruptured vessels, is sufficient of itself, to form a cavity in it. This portion of the blood is in greater proportion in healthy, strong, and robust habits, than in those of an opposite character.

Of the Red Globules.

This part of the blood bears a very important part in the animal economy. Their particular use I trust to make apparent, in the course

of the following inquiry - A few words on the subject of respiration, will perhaps simplify the discussion. It is well known, that vital air, is absolutely necessary in the process of respiration, and that our existence is soon terminated, without its invigorating action upon the lungs. Yet, as by itself, it would prove too stimulating to our system, another species of air is combined with it, in the proportion of nearly three fourths, which sufficiently abates its excessive stimulus. This combination forms the common atmospheric air, which descending into the lungs, in the act of inspiration, the vital, or oxygenous portion, is, by some peculiar unknown animal process; or perhaps, by some chemical affinity, decomposed - by which wonderful and mysterious operation of the animal economy, we become fitted to produce that vivifying principle. Heat; which in the animal body is known by the name of Animal Heat. This decomposition, (if so it may be termed) takes place, either in the lungs themselves, or, in the moment of its combining with the blood. It must be effected in one of these ways, as air cannot exist in a formal

11
State, in the blood vessels; various experiments having fully proved, that injecting even a minute quantity of pure air into them, produces almost instant death; That the Oxygen is separated from the other portions of the air, and decomposed is evident from - 1st The absolute necessity of this species of air to animal life -

2^d From a given quantity sustaining life but a certain time - 3^d The gas emitted by expiration, is a mixture of Carbonic acid gas, Nitrogen gas, & vital air; the Nitrogen existing in an undiminished proportion - 4th If this was not the case, the same quantity, or portion of air, would be fully adequate to the purposes of respiration for ever; and, if some peculiar vivifying principle did not exist in the oxygenous portion of the air, we could, with equal ease respire the Azotic portion of the atmosphere, or even Hydrogen gas -

The utility and vital necessity of oxygenating the blood in some manner, appears to have been as well, or nearly as well, understood by Galen, as it is at the present day - I refer to his book "de utilitate respirationis"

1

Liber XVI, translated by John Redman Coxe M.D.
of Philadelphia, wherein this is made most
clearly apparent; and the perusal of which
will amply repay the time spent.

From what has been stated, it will be
easy to comprehend in what manner death
ensues from drowning, hanging, &c. viz. the
absence of vital air in the lungs, without
which respiration is impossible. The blood
is prevented passing through the lungs, from
the right to the left side of the heart. It
will therefore be accumulated in the veins;
since the arteries are enabled to propel their
contents into them, by the muscularity of their
coats.

Having thus rendered the decomposi-
tion of Oxygen evident, (wherever it may
take place) I now proceed to speak of its
influence, and action on the body, in the state
of its absorption and fixation. And, first
of the Red colour of the blood, and its more
florid appearance in the arteries, than in the
veins. This difference of colour must take
place in the lesser circulation, in the pas-

4
Sage of the blood from the right, to the left side of the heart, through the lungs. Various well authenticated facts are fully sufficient to authorize this conclusion; and, it now only remains to shew, that the cause of this curious change is the absorption of Oxygen from the atmosphere; for which purpose I proceed to enumerate several facts, and experiments, tending to prove it, and which are quoted by various authors -

1st "If the blackish venous blood be exposed in a pure atmosphere, it becomes of a vermilion colour at its surface; Air which has long remained in contact with blood, extinguishes candles, and precipitates lime water -"

2^d "Air injected into a determinate portion of a vein, between two ligatures, renders the blood of a higher colour -"

3^d "By withdrawing the air which is in contact with the blood, it may again be made to lose its colour -"

4th "Blood deposited in a vacuum, by Beccaria, and others, remained black, but assumed a most beautiful vermilion hue, as soon as it was exposed to the air," and, "blood covered with oil, preserved

its black colour."

5th "Orienty caused the blood of a sheep to pass successively into vital air, atmospheric air, mephitic air, &c, and found the blackest parts, assumed a red colour in respirable air; and that the intensity of this colour, was in proportion to the vital air present;" The same philosopher filled a bladder with blood, and exposed it to pure air; that portion of blood which touched the surface of the bladder, became red, while the internal part remained black. An absorption of air therefore, took place, through the bladder, in the same manner as when the contact is direct.

6th Exercise increases the florid appearance of the blood, owing to increased respiration, by which a larger portion of Oxygen is absorbed in a given time -

7th Asthmatic persons do not, in general, possess the florid appearance of blood, observable in healthy individuals, owing to impeded respiration -

8th The Red Globules are very inflammable

On what portion of the blood does the Oxygen act, to produce the Red Globules? This question it is difficult to answer satisfactorily

or with precision. We know the Red globules contain a large proportion of Iron, in the state of an Oxide, and also Phosphoric acid. This Iron, I infer to be the product of animal organization.

1st Because we cannot otherwise account for the quantity always present in the blood.

2^d From analogical induction. For Iron appears to be one of the products of organization, or vegetation; as it is found in vegetables which are supported solely by air, and water. This analogy will be much strengthened, when we consider, that seeds suspended by means of threads, on the surface of pure distilled water, will nevertheless grow, and increase in weight, and are capable of being reduced to the state of earth; tho' none existed in the water itself.

In answer then to the query above propounded, I reply; I think it more than probable, the Serum is the portion, and for the following reasons. 1st The great solubility of the Red globules in the serum. 2^d In health, the serum always decreases in the inverse ratio of the increase of the Red globules. Hence in a mass of healthy blood, one half, or more, is red crur, and

in strong labouring persons, the Serum constitutes only a third part, and is still more diminished in fevers, often to a fourth and fifth part of the mass - even tho' the secretions are diminished at the same time - 3^d By the addition of substances to the Serum, containing a large quantity of Oxygen as Nitric Acid - a light rose colour is produced. Here the Iron does not exist in the proportion necessary to form a red colour, but is sufficient only to produce, as it were, a grade of it -

Having thus endeavoured to shew that the decomposition of Oxygen, and consequent fixation of its base, are the causes of the Red colour of the blood; I now proceed to prove that Animal Heat is dependant on the other principle of Oxygen, which is absorbed by the blood vessels, and conveyed by them, to every part of the body - This portion, or Caloric, which kept the Oxygen in a gaseous state, and which is necessary to the formation of all aeriform fluids, must evidently escape from its combination, and be set at liberty, at the instant of the decomposition of the vital air, and is instantaneously taken up by the blood, whose ca-

capacity for receiving heat is very great, and is much increased by the Oxygen combined with it; Now Chemistry teaches us, that bodies absorb heat in proportion to their capacities for receiving it - That this is its origin, and mode of conveyance, I infer from the following facts - 1st The heat in a joint and limb, is diminished by the application of a ligature, or by compressing the artery, and is again restored, by removing the ligature, or compression - 2^d The heat of a palsied limb, in which however, the circulation is complete, is as great, as in the opposite limb, which is not diseased - 3^d The heat in each class of individual animals, is proportioned to the magnitude of their lungs, according to Buffon, Broussonet, and others - 4th Cold blooded animals have only one auricle, and ventricle - The difference of temperature in different classes of animals, is not less intimately connected with the crasis, & colour of the blood, than we find it to be with the state of respiration - All the more perfect animals, Man, Quadrupeds, and Birds, which are known to generate the highest degrees of heat, have likewise, the greatest proportion of Red globules in their blood - The Amphibious tribe which

~~which~~ are of an inferior temperature, have a proportional diminution in the quantity of Red blood. Next to these come the branchial fishes, which are still more deficient, and apparently, in an exact proportion; And lastly, those which are destitute of gills, have their fluids as transparent, as the element in which they live, and are nearly of the same temperature - as oysters, cockles &c.

5th The heat is nearly, if not quite, the same in every part of the body. 6th The heat of the body is diminished by haemorrhage.

Respiration then, may be considered as an operation, by means of which vital air continually passes, from the gaseous to the concrete state. It must therefore, at each instant abandon the heat which held it in solution, and in the state of gas. This heat, produced at every inspiration, must be proportioned to the volume of the lungs - to their activity - the purity of the air - the rapidity of the inspiration - and, various other causes -

The above facts readily explain, why those animals, which have but one auricle, and one ventricle, have cold blood; and why the heat of animals is, in a great measure, proportioned

21

to the volume of their lungs - In the former case the blood does not pass through the lungs, to imbibe this vivifying principle from the atmosphere - In the latter the air is decomposed more speedily, and in larger quantities - The phenomena of respiration appear therefore to be essentially the same, as those of Combustion -

The quantity of blood in the human body is now, I believe, generally admitted to equal from thirty to forty pounds; of which a little more than half is said to be true red blood; which redness depends on the presence, and constant renewal of Oxygen. This gas is known to be one of the most powerful stimuli in the Universe, and not only the animal, but the vegetable kingdoms, owe in a great degree, their existence to it - This immense quantity of Oxygen, in its passage from the heart, assists in the circulation of the blood, by its stimulating action upon the muscular fibres of the heart, and arteries, (exclusive of the stimulus of distention from the whole mass of blood) by which a contraction of those tubes is effected - The blood is carried by the arteries to all parts of the body, in different proportions - Those parts which are

29

The subjects of motion, particularly the voluntary, receive a very large portion of the red blood - hence, the muscles, in proportion to their size, receive more red blood than other parts, while those which are merely added to give shape to the body, and attachment to its various parts, and which consequently require compactness only, as bones, tendons, and ligaments, have merely the serous, and glutinous portions conveyed to them - Are we not then, authorized to conclude, that these globules serve some important use in the muscles? The cause of muscular motion, has long been a desideratum to the Physiologist, and I believe, that Oxygen is the cause of the irritability and life of organized bodies, and that, after it has effected this important part in the system, it is absorbed by the different stimulating substances from the organized fibre - For, 1st Parts naturally irritable, appear to be so, in proportion to the quantity of red blood conveyed to them - for example, the Heart - 2^d Parts not irritable, are by the conveyance of red blood to them, when in a state of inflammation, possessed of the highest degree of sensibility, and stimulability - as, in the morbid and tender granulations, of bones, ligaments, and

tendous. In this case the nerves become preternaturally sensible, from the increased action of the blood vessels. 3^d Contractility may exist in those parts of the body, which do not contain red blood, but, not irritability -- as in the Lymphatics, whose action appears to resemble the elasticity of inanimate matter. Not that I suppose every part to which red blood is carried, to be possessed of irritability, since the various glands for secretion have a much larger quantity sent to them, than what goes to the muscles, and yet, they are not possessed of this property; which seems to be altogether the result of muscular texture, without which it does not exist. Wherever muscular fibre is, there also is contractility. Yet contractility can exist independent either of muscular fibre, or red globules. This has reference only to animated nature, for vegetables possess irritability, without having either red blood, or muscular fibre. Oxygen however, they possess in large quantities; and the power and wisdom, of the all wise Creator, is abundantly evinced, by producing on different species of organization, similar effects, from the same cause.

Probably this production of irrita-

bility, is owing to some peculiar structure of muscular fibre, by which, it is enabled to produce from the Oxygen, that effect, or principle, upon which the nerves may act, to induce muscular motion. Oxygen therefore, if it does not of itself, absolutely form the principle of irritability, seems at least, to be a condition of its existence in muscular fibre. Fowler says, in his treatise on Animal Electricity, "That he is convinced, from a number of experiments, that this influence, so far from destroying the contractility of the muscles, has a tendency to preserve it; and that Oxygen is, so far as he knows, the only stimulus in Nature, whose effects are at all analogous." It may then be presumed, that this nervous fluid, or animal electricity, is the Oxygen itself, peculiarly modified by the moving fibres of the body. De Balli, and others, in view of these, and similar facts, assert; "that those parts of the nerves hitherto looked upon as their extreme branches, are in fact, their origin" - If this be so, the muscles may be considered as glands, of a peculiar action, secreting from the arteries, this animal influence, or irritability, and the nerves as merely their excretory ducts. Many authors have looked

upon muscle in this light, and the supposition is much strengthened by the fact, that the brain in Man, in proportion to his bulk, is much greater than in any other animal; being four times as large as that of an Ox, perhaps six times his bulk. This is doubtless, for the exertion of those faculties, which Man alone possesses. But we do not find the nerves existing in the same ratio, but proportioned to the size of the animal, and to his organs of sense.

The substance of the heart itself possesses very few nerves. The cardiac nerves accompanying the coronary arteries, appear more necessary to the action of those arteries, than to the heart itself, for its action is not accelerated by irritating those nerves, as was observed by Haller, and others; neither is its motion affected if they be divided, or destroyed. Even wounds of the medulla spinalis - the source of the nerves of the heart - do not alter its functions - Haller says it possesses but few nerves; hence its action must be excited by the stimulus of the blood on its irritable principle - Opium applied externally to the heart, does not affect its motion; but diminished muscular action ensues, when applied to the muscles, or their nerves. In apoplexy

31

all voluntary motion is suspended, yet the heart still continues its action; nay more, it is often increased -

"There is undoubtedly in the air, a certain electrical principle, which, being by respiration, communicated in different ways with the body, imparts a natural tone to the fibres, occasions a quicker motion in the vessels, and increases and diminishes, by turns, the alacrity of the mind." Here, we have in few words, the principal effects of Oxygen - Cullen reports a case, in which the feeling of the hand was entirely lost, owing to palsy of the brachial artery, whose pulsations gradually ceased, from the wrist to the axilla - here, as the nerves were uninjured, is evidently a convincing proof, that some portion of the blood is absolutely necessary to the purpose of sensation, independently of the nerves - These, and many other considerations, which I omit, abundantly prove the vitality of the blood - for it appears strange that, from an inanimate mass, all the vital parts of the body, should be produced, or that, Providence should make so large a quantity of fluid necessary to our existence, if nothing more than

merely the nourishment of our bodies was intended, as this expends but a small proportion of it. Poisons when injected into the blood repels, cause instant death, but no ill effect is produced, when introduced into the stomach, or placed in contact with a nerve. Blood preserves life in the different parts of the body; when the nerves going to any part, are cut, or tied, that part becomes paralytic, but it does not mortify; if however, the artery be cut, the part dies, and mortification ensues.

The Holy Scriptures assure us, "that in the blood, is the life of the flesh." The blood may therefore be considered as a fluid sui generis, such as man cannot compound. It is entirely unconnected by adhesion to any part, in its ceaseless flow, and yet is essential to the existence, the nourishment, and the vitality, of every organized tissue of the body. We know not where, or how it is created, from the inanimate mass of chyle received. It is an imperium in imperio, and is apparently governed by laws, exclusively its own. For it has no nerves, or actual connection with any, and hence is devoid of sensibility; It is in short, the *primum vivens*, the *ultimum moriens*,

of created beings, and in every respect fully corroborates the above quoted Scriptural doctrine—

Hence, and hence only, can we comprehend the high estimate put upon it, by our Almighty Creator; Hence, the eating of it was prohibited—Hence, it was the part of the sacrifice peculiarly offered to Divine Majesty—Hence, the absolute, and unqualified law, laid down by God himself, and never abrogated, under either the old, or new covenant, that "whosoever sheds the blood of man, by man shall his blood be shed"—And, to all this, may be added, that in the extensive compass of Medical literature, from the earliest period to the present time, amidst the numerous varieties of monstrosities, recorded by Anatomists, of the want of Head, Brain, Stomach, Lungs, Heart—Intestines, Liver, Bladder, in short, of every individual organ, or tissue, the Blood alone, has never been found wanting—

From what I have said, we may readily see, how important a part Oxygen acts in the body—Its uses we find are numerous—It will lead us to account for the fact, so often referred to, that the punctum saliens, or pulsation of the heart in a chick, is not evident, til' the appearance of the

red globules. As it is the Oxygen, which is the cause of the redness of the blood, it may be asked, how Oxygen can enter into an egg? To this, I reply, that it has been fully proven, that the portion of air, which we always find in one end of the egg, is Oxygenous gas, and that it is vitiated, in proportion as the chick arrives at maturity; Now, we do not precisely know; but, probably by absorption, as we find this gas in contact with the white of the egg, which is known to resemble, in many respects, the serum of the blood.

Having thus endeavoured to explain some of the wonderful phenomena of the animal economy. I now proceed to treat of
Inflammation.

I shall first consider a few of the various theories, which have been propounded at different times. The first, of any importance, which we find is that of Bellini, who makes it consist in a Sedor, or obstruction of the extreme vessels in which red blood is contained. In this, he was followed by Boerhaave. This doctrine was however, completely refuted by Cullen, and actual experiments have proven that no such

obstruction occurs - This doctrine seems to have arisen from the appearance of the buffy coat, on the blood drawn in inflammation, and which was supposed to be caused by a preternatural spissitude of that fluid. It is now, however well known, that in inflammation, the blood is of a thinner consistence than usual, and the appearance of the buff is accounted for in this manner - The blood being longer in coagulating, the gluten, or coagulable lymph, permits the red globules to precipitate, and thus leave this yellowish tenacious substance, at the superior part of the vessel in full view - But modern authors, (Mazendie and others) assure us, that the yellowish stratum, or buffy coat, consists of fibrin, separated from the red globules, and that a physical agency, perfectly independant of inflammation, (specific gravity) is the cause of this abnormal super-position of the fibrin - This buff, which is only an occasional appearance in human blood, occurs constantly in that of the Horse, and other animals, and there commonly forms two thirds of the total mass of the clot. The practical question to which the

subject of the buff coat, is, whether we can ratio-
 nally deduce any consequences from its presence.
 It has long been the invariable habit of Allo-
 pathic authors of treatises on practical medicine,
 to recommend attentive examinations of the blood,
 and their instructions are generally followed, but
 the manner in which the task is performed is ex-
 tremely superficial, and yet, from the scanty in-
 formation thus obtained, the necessity of a sec-
 ond bleeding is very often inferred. But how can
 we draw any inference of importance from the
 presence of buff, when, as every one knows, its
 formation depends on various circumstan-
 ces, that have no sort of connection with dis-
 ease? Thus, if the opening in the vein be too
 small; or, its parallelism with that of the in-
 teguments imperfect; or, if a globule of fat in-
 terfere with the flow of the blood, and cause
 the liquid to trickle away, it is certain no buff
 will form; But open the same vein largely,
 and receive the blood into a narrow, and deep
 vessel, and on the following day, you will find
 the results in the two cases, widely different.
 Now this simple exposition of well known facts,

at once ~~radicates~~ radicates all pathological views, founded upon the presence of the buff - What consequence then, can be attached to the appearance of a condition, which extraneous agencies so materially influence? Allopaths bleed, because the buff is an inflammatory phenomenon, and they bleed again, and again, to cause its disappearance. They sometimes succeed - but why? There are two reasons why it should so happen - either the patient is worn out, and exhausted by the frequent abstraction of blood, (and this is by far the most common cause) and his impoverished fluids, deprived in a great measure, of their fibrin, are absolutely incapable of affording any more of that principle for separation; or, if the individual be robust, and plethoric, and his blood has resisted the means of effecting its decomposition, employed with so much hardihood - all this proves, is, that the last venesection was performed under conditions, such as those above described, as being favorable to the production of the phenomenon.

It is extremely difficult, as is very well known, to eradicate the most absurd preju-

dices. In spite of the evidence of experience, Allopaths continue to maintain, that the buff is the origin, and source of inflammation; and of course, continue to bleed, in defiance of all the information thus acquired, in order to combat the ridiculous and absurd bugbear of Pathologists; and, tho' they are, or ought to be aware, that the buff is developed under every condition of the system, both in health, and disease. — If bleeding be prescribed, because the blood is buffy, I hesitate not to assert, that those who so prescribe it, act in defiance of well authenticated FACTS. — and hence, are the authors of irreparable injury to the human constitution. — Blood letting, employed by Allopaths, in nearly every acute disease, is one of the best means of inducing those very diseases in healthy individuals. — It lessens the quantity of fibrin, proportionally increases that of the serum, and weakens the energy of coagulation. — and whatever interferes with the coagulability of the blood, its most important quality, manifests itself by morbid alterations in the organs, whence in their turn, re-

Such a great variety of serious general affections;
 In short, to bleeding alone may be attributed,
 much of the great mortality incident to large
 cities, where Physicians being numerous, and
 armed with the potent lancet, - potent for
 evil, but powerless for good - bleeding is re-
 sorted to, in nearly every acute disease, with-
 out regard to, or reckless of, consequences -

A second cause of inflammation,
 proposed by Boerhaave consisted of obstruc-
 tion from Error Soci, or, "the passage of blood
 out of its proper vessels, into those which con-
 tain more subtil juices -" hence, he says, "the
 seat of an inflammation, may be as well in the
 arteries themselves, as in the veins, membranes,
 nerves, muscles, glands, bones, cartilages, and
 tendons, with all the viscera" - Another
 doctrine is, that of obstruction producing ir-
 ritation. This may be an important means
 of producing inflammation, acting as a remote
 cause, in debilitating the part - but it can
 never be the proximate cause - - I would
 here state, that I wish to be understood, as
 treating of inflammation, as it generally

makes its appearance in Phlegmon; tho' I am of opinion, the term applies to every case in which any fluid, escaping out of its proper vessels, into such as naturally contain a finer fluid, thereby produces Error Sici, and convulsive action of the vessels of the part, which by sympathy, or by their irritation induced, may affect the smaller and serous vessels, and by debilitating them, produce an Error Sici of Red Blood, which will ultimately induce a true phlegmonic inflammation -

I define Phlegmon to be, a circumscribed tumour, attended with heat, redness, tension, and a throbbing pain; and if extensive, with fever - A small inflammation of long continuance, will however induce fever, in the system, by sympathy in the muscular fibres of the arteries - This I have frequently observed, in a tripling inflammation of the extremity of the finger, caused by merely pulling off a piece of the skin at the nail, -

With respect to the Proximate cause of inflammation, I judge it to be, a convulsive, or irregular action in the vessels of the part,

often by sympathy, bringing the whole arterial system into action, and thereby inducing the phlogistic diathesis - This diathesis may however exist, independantly of topical affections, and it then appears as a simple inflammatory fever - tho' this is seldom the case, for some part will generally be in a state of greater debility, than the rest of the system, owing to a variety of causes; from which circumstance, the effects of the circulation will be felt in that, rather than in any other part - hence, according to the part on which it acts, will occur Pneumonia, Gastritis, Pleuritis, &c. of different degrees of violence, proportioned to the acting causes - All the phenomena which occur in inflammation, shew distinctly, the existence of irregular action in the part.

Of the Remote causes of Inflammation - These may be divided into five heads -

- 1st The application of stimulant substances.
- 2^d External violence operating mechanically, in wounding, bruising, compressing, or overstretching the parts;
- 3^d Extraneous substances

lodged in any part of the body, irritating by their chemical acrimony, or mechanical form, or compressing by their bulk, or gravity -

4th A certain degree of cold, not immediately sufficient to produce gangrene

5th An increased impetus of the blood, determined to a particular part -

A view of these remote causes will shew, that, they all evidently act, by inducing Debility in the part, before inflammation can take place - Indeed their chief action is that of debilitants, by which they give an opportunity for the action of the exciting cause of Error Sici - This, in true phlegmonic inflammation, consists of red globules passing into serous vessels, which they quickly excite into action, by their excess of stimulus, and by sympathy, or imitation, the surrounding ones, are soon brought into the same state -

Imagine therefore, that without Error Sici, Inflammation cannot exist, and, that Error Sici cannot occur, until the part is debilitated - The Error Sici may occur either - 1st From a laxity of the vessels of the

part, unaccompanied by any greater momentum in the force, or velocity of the blood.

2^d From an increase of the blood's momentum -
Or, 3^d By a combination of both -

To sum up in a few words, my ideas of inflammation - The remote causes act, by inducing debility - hence Error Soci, which acts as an exciting cause, upon the accumulated excitability of the debilitated muscular fibres of the arteries; and thereby produces convulsion, or irregular action in the vessels of the part -

Of the Terminations of Inflammation -

If inflammation be cured, without loss of substance, and while the state, and texture of the part remain entire, the disease is said to terminate by Resolution - If from the excess of the inflammation, and violent impetus of the blood, the vessels are ruptured, and their contents poured out, a re-absorption does not readily take place; but the fluids undergo a particular change; being converted into Pus. At the same time, an abatement of the redness, heat, and pain occur, and the disease

is now said, to terminate by Suppuration - The part containing this collection of Pus, is called an abscess -

It sometimes happens, either from the extreme violence of the inflammation, or from some peculiar acrimony of the fluids of the diseased part, or from very great debility in the part, that the degree of inflammation necessary to the production of Pus, cannot take place; so that, the effused fluids are affected with a state, approaching more, or less, to putrefaction - When this is moderate in degree, and affects chiefly the fluids effused - the parts are said to be in a state of Gangrene - But if the solids also become affected, the disease is then termed Ulcer, or Mortification - It is not always necessary for Gangrene to be preceded by Suppuration - In inflammation the tendency to Gangrene may be apprehended from an extreme violence of pain, and heat in the inflamed part, and from a great degree of pyrexia attending the inflammation - The actual coming on of Gangrene, may be perceived by the colour of the inflamed part changing from

a clear, to a dark red; by blisters arising upon the part, becoming soft, flaccid, and insensible; and by the cessation of all pain, when these appearances occur. As the Gangrene proceeds, the colour of the part becomes livid, and by degrees, quite black - the heat of the part entirely ceases - the softness, and flaccidity increase - the part loses its consistence - exhales a cadaverous odour - and may then be considered as affected with *Phacelus* - Another termination of inflammation is, in *Schirrus*, or an indolent hardness of a part. This termination appears to be wholly connected with glandular parts - as the Nose, mouth, breasts, testes, liver, uterus, spleen &c. - I do not recollect a single instance of any, of these glandular parts, being affected by a true *Schirrus* - It is entirely useless to extirpate a cancerous breast, unless we can totally, and entirely remove the infected glands, as, the cancerous humour left behind, will most assuredly, renew the disease, and generally, with redoubled virulence -

Of the Prognosis of Inflammation -

This may be concisely summed up - Thus - The

61
progress of an inflammation is deduced from considering its cause - part affected - magnitude - depth - violence - the habit of the patient - the several symptoms - and, by comparing these, with the demonstrative signs, and effects, or consequences of the inflammation -

Having thus considered, tho' imperfectly, those subjects which I proposed examining in the commencement of this inquiry - I cannot conclude, without noticing the wonderful, yet uniform simplicity, existing throughout all the operations of Nature - It clearly evinces the connection of truths, and that they are all links of one great chain - mutually sustaining, and strengthening each other - By the operation of a single cause - the decomposition of vital air, and subsequent fixation of its base - we see the production of Combustion; Respiration, and its effects; the Oxidation of metals; and Fermentation - How can we sufficiently admire this amazing simplicity in the works of Nature? or, to speak more properly, how can we sufficiently admire, and adore, the Wisdom of that great Being, from whom this simplicity is derived?

An Essay

on the
Coinciding Tendency of Medicine

Respectfully Submitted

to the
Homoeopathic Medical College
of Pennsylvania

on the first day of January
One thousand Eight Hundred & Eighty

for the
Graduate in Medicine

Louis Dodge of Michigan.